

WHAT IS CLAIMED IS:

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1. A membrane artificial lung for performing gas exchange between blood and a gas via the membrane by flowing the blood in one side of the membrane and flowing oxygen or an oxygen-containing gas in the other side of the membrane,

wherein said membrane comprises a hollow fiber membrane, said hollow fiber membrane comprising poly-4-methylpentene-1 and having an oxygen permeation rate $Q(O_2)$ at 25°C of from 1×10^{-6} to 3×10^{-3} (cm³(STP)/cm²·sec·cmHg) and an ethanol flux of from 0.1 to 100 ml/min·m²,

wherein said membrane has, in the side of the blood flow, a surface comprising an ionic complex derived from:

quaternary aliphatic alkylammonium salts; and

heparin or a heparin derivative, and

wherein said quaternary alkylammonium salts comprise a quaternary aliphatic alkylammonium salt having from 22 to 26 carbon atoms in total and a quaternary aliphatic alkylammonium salt having from 37 to 40 carbon atoms in total.

2. The membrane artificial lung according to claim 1, wherein said quaternary alkylammonium salt comprises from 5 to 35% by weight of a quaternary aliphatic

alkylammonium salt having from 22 to 26 carbon atoms in total and from 65 to 95% by weight of a quaternary aliphatic alkylammonium salt having from 37 to 40 carbon atoms in total.

3. The membrane artificial lung according to claim 1, wherein said quaternary aliphatic alkylammonium salt comprise a dimethyldidodecylammonium salt and a dimethyldioctadecylammonium salt.

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ABSTRACT OF THE DISCLOSURE

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A membrane artificial lung for performing gas exchange between blood and a gas via the membrane by flowing the blood in one side of the membrane and flowing oxygen or an oxygen-containing gas in the other side of the membrane, wherein said membrane comprises a hollow fiber membrane, said hollow fiber membrane comprising poly-4-methylpentene-1 and having an oxygen permeation rate $Q(O_2)$ at 25°C of from 1×10^{-6} to 3×10^{-3} ($\text{cm}^3(\text{STP})/\text{cm}^2 \cdot \text{sec} \cdot \text{cmHg}$) and an ethanol flux of from 0.1 to 100 $\text{ml}/\text{min} \cdot \text{m}^2$, wherein said membrane has, in the side of the blood flow, a surface comprising an ionic complex derived from: quaternary aliphatic alkylammonium salts; and heparin or a heparin derivative, and wherein said quaternary alkylammonium salts comprise a quaternary aliphatic alkylammonium salt having from 22 to 26 carbon atoms in total and a quaternary aliphatic alkylammonium salt having from 37 to 40 carbon atoms in total.